to tissues expressing mannose on their surface than capsules coated with surface saturating quantities of peanut agglutinin or wheat germ agglutinin. Similar experiments were conducted with galactose and the lectins concanavalin A, peanut agglutinin, and wheat germ agglutinin. (Results not shown). The rank order of the galactose binding capacity of the two capsular bound biotinylated lectins was found to be as follows.

Concanavalin A>Wheat Germ Agglutinin>Peanut Agglutinin

These findings show that capsules coated with a surface saturating quantity of concanavalin A would adhere more strongly to tissues expressing galactose on their surface than capsules coated with surface saturating quantities of wheat germ agglutinin or peanut agglutinin. A comparison of the data obtained indicates that concanavalin A is only moderately more selective for mannose than galactose whereas peanut agglutinin is substantially more selective for galactose than mannose when bpound to capsular surfaces.

Completely formed capsules are white spheres approximately 2.9 mm in diameter. Separately prepared batches of spermine alginate microcapsules were sized using a Coulter counter. The average diameter of the microcapsules was found to be 3.8 microns.

Alkyl amines used to form microcapsules by interfacial precipitation with sodium alginate must possess multiple amino functionalities in order to be surface modified using the described procedures. The presence of multiple amino functionalities, as in the case of spermine, allows the EDC-NHSS mediated formation of amide bonds involving the avidin carboxylates and the spermine amines.

While this invention has been described with reference to specific, and particularly preferred embodiments thereof, it is not limited thereto, and the appended claims are intended to be construed to encompass not only the specific forms and variants of the invention shown, but to such other forms and variants as may be devised by those skilled in the art without departing from the true spirit and scope of the invention.

We claim:

1. A composition, comprising at least one microcapsule(s) comprising an aqueous core surrounded by a capsular wall having a surface provided with peptide(s) linked thereto, the peptide(s) having a free segment(s) of pre-determined binding specificity(ies) capable of selective attachment to macromolecules, cells, and/or tissues displaying on their surfaces characteristic epitopic markers and the wall comprising the reaction product of a polymer having a plurality of anionic residues and a monomer having a plurality of amine residues wherein the capsular wall comprises an excess of either said anionic or amine residues, to which the peptide(s) is (are) linked.

2. The composition of claim 1, wherein the capsular wall comprises an excess of amine residues, to which the peptide (s) is (are) linked, and said monomer includes three or more amine residues.

3. The composition of claim 2, wherein the microcapsule (s) further comprise(s) a bifunctional agent linking the excess amine or anionic residues and the peptide(s).

4. The composition of claim 3, wherein the linking agent comprises a binding pair selected from the group consisting of avidin and biotin, streptavidin and biotin, avidin and p-hydroxy-benzene-azo-benzoic acid, streptavidin and p-hydroxy-benzeneazo-benzoic acid, protein G and immunoglobulin A, G, and M, protein A and immunoglobulin A, G, and M, and antibody or antibody fragments thereof and complementary antigens, wherein the biotin and the p-hydroxy-benzene-azo-benzoic acid are linked to the segment(s) of pre-determined binding specificity(ies).

5. The composition of claim 4, wherein the linking agent comprises biotin-avidin.

6. The composition of claim 1, wherein the polymer comprises an anionic residue selected from the group consisting of reactive carboxylate, phosphate, phosphamido, sulfonate, and sulfate groups.

7. The composition of claim 6, wherein the polyanionic monomer or polymer is selected from the group consisting of alginic acid, arabic acid, cellulose sulfate, carboxymethylcellulose, carrageenans, chondroitin sulfate, heparin, polyacrylic acid, polyoxyethylene cross-linked polyacrylic acid, polyphosphazine, lactic esters of polyphosphazine, hyaluronic acid, and polyvinylcarboxylic acid.

8. The composition of claim 1, wherein the polyamine comprises di-, tri-, tetra-amines, mixtures thereof, or mixtures thereof with monoamines.

9. The composition of claim 8, wherein the polyamine is selected from the group consisting of $(C_1–C_{16})$ alkylene diamines, $(C_1–C_{16})$ alkylene triamines, $(C_1–C_{16})$ alkylene tetraamines, mixtures thereof, and mixtures thereof with $(C_1–C_{16})$ monoamines.

10. The composition of claim 9, wherein

the polyamine is selected from the group consisting of ethylene diamine, propylene diamine, butylene diamine, pentylene diamine, piperazine, spermidine, diethylene triamine, methylene blue, and spermine; and

the monoamine is selected from the group consisting of decylamine, dodecylamine, tetradecylamine, hexadecylamine, octadecylamine, and didecylamine.

11. The composition of claim 10, wherein the anionic polymer comprises alginic acid, and the polyamine comprises spermine.

12. The composition of claim 10, wherein the anionic polymer comprises chondroitin sulfate, and the polyamine comprises spermine.

13. The composition of claim 10, wherein the anionic polymer comprises polyacrylic acid, and the polyamine comprises diaminobutane.

14. The composition of claim 10, wherein the anionic polymer comprises arabic acid.

15. The composition of claim 1, wherein the anionic polymer has an average molecular weight greater than about 10 Kilodaltons.

16. The composition of claim 1, wherein the anionic polymer is modified by a signaling agent selected from the group consisting of fluroescein isothiocyanate, rhodamine isothiocyanate, eosin isothiocyanate, sulforhodamine acid chloride, ferritin, ferrocene carboxylic acid(s), gold conjugates, ^{3}H-acetic anhydride, ^{14}C-acetic anhydride, ^{125}I-benzoic acid, and luciferase.

17. The composition of claim 1, wherein the peptide(s) is(are) selected from the group consisting of avidin, streptavidin, lectins, antibodies, immunoglobulin G, protein A, protein G, and antigens.

18. The composition of claim 17, wherein the peptide(s) comprises a lectin(s).

19. The composition of claim 18, wherein the lectin(s) is (are) selected from the group consisting of *Arachis hypogaea, Canavalia ensifonnia,* succinylated *Canavalia ensiformis, Lens culinaria, Erythina corallodendron, Lycopersicon esculentum, Vicia villosa, Phaseolis vulgaris, Gylcine max, Triticum vulgaris,* and *Ulex europeaus* lectins.

20. The composition of claim 17 , wherein the peptide(s) comprises avidin, or streptavidin.

21. The composition of claim 17, wherein the peptide(s) comprises an antibody selected from the group consisting of IgA, IgG, IgM, and Fab and Fab' fragments thereof.